Genetic diversity of Synechococcus in Puget Sound and the Northwest Straits

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The cyanobacteria are a diverse group of aquatic, photosynthetic bacteria. As picophytoplankton, the cyanobacterial genus Synechococcus contributes substantially to oceanic primary production and plays a crucial ecological role as the base of the marine food web. Members of this genus are found in coastal as well as oligotrophic waters. Current data regarding their genetic diversity comes mainly from oligotrophic regions, however, leaving coastal waters largely underrepresented. In order to better understand Synechococcus diversity and distribution patterns within Puget Sound and the Northwest Straits, we collected environmental water samples from the San Juan Channel, the Strait of Juan de Fuca, and Dabob Bay. We focused on the diversity of the 16S-23S rRNA Internal Transcribed Spacer (ITS). ITS regions were PCR-amplified from the environmental samples using cyanobacterial specific primers, and PCR products were cloned and sequenced. Phylogenetic analysis revealed that our clone sequences sorted into four groups (out of more than 10 previously characterized). Each of these four groups also contained sequences previously obtained from oligotrophic and coastal sites in various parts of the world. This pattern suggests that Synechococcus in Puget Sound and the Northwest Straits can be used as a model for studies in other coastal regions as well.